

ABSTRACT OF THE DISCLOSURE

Compressive and tensile structural elements are disclosed having an enclosure with walls surrounding a cavity. A non-compressible material is disposed in the cavity. The walls are shaped such that a force tending to compress or elongate the element by a first deflection causes an amplified second deflection of the walls into the non-compressible material. The second deflection exerts a compressive force against the non-compressible material, resulting in a resistance to the first deflection and the force tending to compress or elongate the structural element. The walls of the elements are configured for optimum rigidity and/or optimum damping. Structural beams and motion impartation devices utilizing the structural elements to provide lightweight rigidity and/or damping are also disclosed. Another aspect of the present invention are methods of fabricating the structural beams.